

What is claimed is:

1. A disk array device including a component that can be degraded, and comprising:
 - a trouble point storage unit which stores a point value of the component;
 - a point update unit which subtracts a predetermined point value from the point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on the component;
 - a degradation unit which degrades the component when the point value stored in said trouble point storage unit falls below a reference value; and
 - a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time.
2. A disk array device including a component that can be degraded, and comprising:
 - a trouble point storage unit which stores a point value of the component;
 - a point update unit which adds a predetermined point value from the point value stored in said trouble point storage unit and stores the added point value in said trouble point storage unit, when a processing fault occurs on the component;
 - a degradation unit which degrades the component when the point value stored in said trouble point storage unit exceeds a reference value; and
 - a trouble point recovery unit which subtracts an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had subtracted to the point value a last time.
3. A disk array device which can degrade a plurality of disks and comprises:
 - a trouble point storage unit which stores point values of each disk;
 - a point update unit which subtracts a predetermined point value from the

- corresponding point value stored in said trouble point storage unit and stores the
5 subtracted point value in said trouble point storage unit, when a processing fault occurs on
one of the disks;
a degradation unit which degrades a corresponding disk when the point value stored
in said trouble point storage unit falls below a reference value; and
a trouble point recovery unit which adds an another predetermined point value to
10 each point values stored in said trouble point storage unit, when a predetermined time
period passes since the trouble point recovery unit had added to the point value a last
time.

4. The disk array device according to claim 3:

wherein said trouble point storage unit comprises a trouble case table storing point
values of each disk and a processing-time-reference exceeding case table storing point
values of each disk;

- 5 said disk array device further comprises a processing-time-reference exceeding case
point update unit which subtracts a predetermined point value from the point value stored
in said processing-time-reference exceeding case table, in a case where a processing time
for a required processing exceeds a reference time on a disk;

wherein said trouble case point update unit updates point value stored in said trouble
10 case table; and

wherein said degradation unit degrades a corresponding disk when the point value
stored in said trouble case table falls below a first reference value or the point value
stored in said processing-time-reference exceeding case table falls below a second
reference value.

5. The disk array device according to claim 3, further comprising:
a point initialization unit which sets, in a case where a defective disk is replaced, a point
value corresponding to the defective disk stored in said trouble point storage unit to an
initial value.

6. The disk array device according to claim 3,

wherein said degradation unit

receives a point update notification concerning a disk number from said trouble case point update unit, and

5 determines whether the point value stored in said trouble point storage unit in association with the disk number is equal to or lower than a predetermined reference value, and degrades a disk having the disk number in a case where determining that the point value is equal to or lower than the reference value.

7. The disk array device according to claim 3,

wherein said point update unit notifies information indicating that the point value has been updated to said degradation unit.

8. A disk array device comprising:

a trouble point storage unit which stores a point value of the component;

a point update unit which subtracts a predetermined point value from the point value stored in said trouble point storage unit and stores the subtracted point value in said

5 trouble point storage unit, when a processing fault occurs on the component;

a processing rate adjusting unit which lowers a processing rate of a component in a case where the point value of the component stored in said trouble point storage unit becomes equal to or lower than a reference value, and sets the processing rate of the component to a predetermined normal state in a case where the point value of the

10 component stored in said trouble point storage unit exceeds the reference value; and

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit added to the point value a last time.

9. A disk array device which can degrade a plurality of disks comprising:

a trouble point storage unit which stores point values of each disk;

a point update unit which subtracts a predetermined point value from the

- corresponding point value stored in said trouble point storage unit and stores the
5 subtracted point value in said trouble point storage unit, when a processing fault occurs on
one of the disks;
a processing rate adjusting unit which lowers a processing rate of a disk in a case
where the point value of the disk stored in said trouble point storage unit becomes equal
to or lower than a reference value, and sets the processing rate of the disk to a
10 predetermined normal state in a case where the point value of the disk stored in said
trouble point storage unit exceeds the reference value; and
a trouble point recovery unit which adds an another predetermined point value to
each point values stored in said trouble point storage unit, when a predetermined time
period passes since the trouble point recovery unit had added to the point value a last
15 time.

10. The disk array device according to claim 9 wherein:
the plurality of disks is mirrored; and
said processing rate adjusting unit lowers a processing rate of a disk and raises a
processing rate of a disk paired with the disk in a case where the point value of the disk
5 stored in said trouble point storage unit becomes equal to or lower than the reference
value, and sets the processing rate of the disk and the processing rate of the paired disk to
the predetermined normal state in a case where the point value of the disk stored in said
trouble point storing unit exceeds the reference value.

11. The disk array device according to claim 10 wherein:
said processing rate adjusting unit
reads the point values of each disk storing in said trouble point storage unit;
determines whether or not the point value change from greater than the reference
5 value to equal to or lower than the reference value, and lowers a processing rate of a disk
in a case where determining that the point value of the disk change to equal to or lower
than the reference value; and

determines whether or not the point value change from equal to or lower than the reference value to greater than the reference value, and adjusts a processing rate of a disk
10 so as to set a predetermined initial rate in a case where determining that the point value of the disk change to greater than the reference value.

12. A component degradation method in which a disk array device, having a plurality of components degradable and a memory storing point values regarding each of the plurality of components, comprises:

subtracting a predetermined point value from the point value stored in said memory
5 and storing the subtracted point value in said memory, when a processing fault occurs on one of the components;

degrading the component when the point value stored in said memory falls below a reference value; and

adding an another predetermined point value to the point value stored in said
10 memory, when a predetermined time period passes since a last addition of the point value.

13. A component degradation method in which a disk array device, having a plurality of components degradable and a memory storing point values regarding each of the plurality of components, comprises:

adding a predetermined point value from the point value stored in said trouble point
5 storage unit and storing the added point value in said trouble point storage unit, when a processing fault occurs on the component;

degrading the component when the point value stored in said trouble point storage unit exceeds a reference value; and

subtracting an another predetermined point value to the point value stored in said
10 trouble point storage unit, when a predetermined time period passes since last subtraction of the point value.

14. A disk degradation method in which a disk array device, having a plurality of disks degradable and a memory storing point values regarding each of the plurality of

disks, comprises:

- substracting a predetermined point value from the corresponding point value stored
5 in said memory and storing the subtracted point value in said memory, when a processing
fault occurs on one of the disks;
- degrading a corresponding disk when the point value stored in said memory falls
below a reference value; and
- adding an another predetermined point value to each point values stored in said
10 memory, when a predetermined time period passes since a last addition of the point value.

- 15. The disk degradation method according to claim 14,
 - wherein said memory stores first point values and second point values regarding
each of the plurality of disks;
 - said disk degradation method comprises:
 - 5 subtracting a first predetermined point value from the corresponding first point
value stored in said memory and storing the subtracted point value in said memory, when
a processing fault occurs on one of the disks;
 - substracting a second predetermined point value from the corresponding second point
value stored in said memory and storing the subtracted point value in said memory, in a
10 case where a processing time for a required processing exceeds a reference time on one of
the disk ;
 - degrading a corresponding disk when the first point value stored in said memory
falls below a first reference value or the second point value stored in said memory falls
below a second reference value; and
 - 15 adding an another predetermined point value to each point values stored in said
memory, when a predetermined time period passes since a last addition of the point value.
- 16. The disk degradation method according to claim 14,
 - said disk degradation method further comprises:
 - setting each point value corresponding to the defective disk stored in said trouble

point storage unit to an initial value, in a case where a defective disk is replaced.

17. A method of restricting a drop in performance of a disk array device wherein a disk array device, having a plurality of disks, a memory storing point values regarding each of the plurality of disks comprises:

- subtracting a predetermined point value from the corresponding point value stored 5 in said memory and stores the subtracted point value in said memory, when a processing fault occurs on one of the disks;
- lowering a processing rate of a disk in a case where the point value of the disk stored in said memory becomes equal to or lower than a reference value;
- setting the processing rate of the disk to a predetermined normal state in a case 10 where the point value of the disk stored in said memory exceeds the reference value; and
- adding some point value to each point value stored in said memory, when a predetermined time period passes since a last addition of the point value.

18. The method of restricting a drop in performance of a disk array device according to claim 17:

wherein said disk array device further has a control unit controlling read processing and write processing on each of the plurality of disks, comprises:

- 5 issuing an instruction to the control unit so that a processing rate of a disk is lowered in a case where it is detected that the point value of the disk stored in the memory becomes equal to or lower than the reference value, and
- issuing an instruction to said control unit so that the processing rate of the disk is changed to a predetermined normal rate in a case where it is detected that the point value 10 of the disk stored in the memory becomes greater than the reference value.

19. A computer program for controlling a computer having of degradable component to act as:

- a trouble point storage unit which stores a point value of the component;
- a point update unit which subtracts a predetermined point value from the point value

- 5 stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on the component;
- a degradation unit which degrades the component when the point value stored in said trouble point storage unit falls below a reference value; and
- a trouble point recovery unit which adds an another predetermined point value to the
- 10 point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time.

20. A computer program for controlling a computer having a plurality of degradable disks to act as:

- a trouble point storage unit which stores point values of each disk;
- a point update unit which subtracts a predetermined point value from the
- 5 corresponding point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks;
- a degradation unit which degrades a corresponding disk when the point value stored in said trouble point storage unit falls below a reference value; and
- 10 a trouble point recovery unit which adds an another predetermined point value to each point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time.

21. A computer program for controlling a computer having a plurality of degradable disks to act as:

- a trouble point storage unit which stores point values of each disk;
- a point update unit which subtracts a predetermined point value from the
- 5 corresponding point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks;

a processing rate adjusting unit which lowers a processing rate of a disk in a case where the point value of the disk stored in said trouble point storage unit becomes equal
10 to or lower than a reference value, and sets the processing rate of the disk to a predetermined normal state in a case where the point value of the disk stored in said trouble point storage unit exceeds the reference value; and
a trouble point recovery unit which adds an another predetermined point value to each point values stored in said trouble point storage unit, when a predetermined time
15 passes since the trouble point recovery unit added to the point value a last time.